

Lesson 2: Solving Multi-Step Equations

$$4(2x-11) - 6x = -3$$

$$\textcircled{1} \quad 4(2x-11) - 6x = -3$$

$$8x - 44 - 6x = -3$$

$$8x - 6x - 2x$$

$$\textcircled{2} \quad 2x - 44 = -3$$

$$\textcircled{3} \quad +44 \quad +44$$

$$\textcircled{4} \quad \frac{2x}{2} = \frac{41}{2}$$

$$x = 20.5$$

$$\textcircled{5} \quad 4(2 \cdot 20.5 - 11) - 6(20.5) = -3$$

$$4(41 - 11) - 123 = -3$$

$$4(30) - 123 = -3$$

$$120 - 123 = -3$$

$$-3 = -3 \quad \checkmark$$

1) Get rid of grouping symbols by performing the operation

2) Combine like terms on each side of the equal sign

3) If constants are on both sides of equal sign, move to one side by using inverse operations

4) If variable has a coefficient other than 1, use inverse operation to make it equal 1

5) Always check your work by plugging in answer you got for the variable. Use order of operations to solve.

Practice Multi-Step Equations

1. $3(x+1) = 6$

$$3x + 3 = 6$$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{3}{3}$$

$$\boxed{x = 1}$$

check: $3(1+1) = 6$

$$3(2) = 6$$

$$6 = 6 \checkmark$$

3. $2(x-1) - 4x = 16$

$$2x - 2 - 4x = 16$$

$$-2x - 2 = 16$$

$$\begin{array}{r} +2 \quad +2 \\ \hline \end{array}$$

$$-2x = 18$$

$$\frac{-2x}{-2} = \frac{18}{-2}$$

$$\boxed{x = -9}$$

check: $2(-9-1) - 4(-9) = 16$

$$2(-10) + 36 = 16$$

$$-20 + 36 = 16$$

$$16 = 16 \checkmark$$

2. $2(x+2) - 5 = 7$

$$2x + 4 - 5 = 7$$

$$2x - 1 = 7$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$\boxed{x = 4}$$

check: $2(4+2) - 5 = 7$

$$2(6) - 5 = 7$$

$$12 - 5 = 7$$

$$7 = 7 \checkmark$$

4. $-4(x+4) + 2x = 46$

$$-4x - 16 + 2x = 46$$

$$-2x - 16 = 46$$

$$\begin{array}{r} +16 \quad +16 \\ \hline \end{array}$$

$$-2x = 62$$

$$\frac{-2x}{-2} = \frac{62}{-2}$$

$$\boxed{x = -31}$$

check: $-4(-31+4) + 2(-31) = 46$

$$-4(-27) - 62 = 46$$

$$108 - 62 = 46$$

$$46 = 46 \checkmark$$